WHAT IS CLAIMED IS:

1. An apparatus for receiving a non-coherent layered modulation signal, comprising:

a) a tuner for receiving a layered signal and producing a layered in-phase signal and a layered quadrature signal therefrom;

b) an analog-to-digital converter for digitizing the layered in-phase signal and the layered quadrature signal;

c) a processor for decoding the layered in-phase signal and the layered quadrature signal to produce a single layer in-phase signal and a single layer quadrature signal;

d) a digital-to-analog encoder for converting the single layer in-phase signal and the single layer quadrature signal to a single layer in-phase analog signal and a single layer quadrature analog signal; and

e) a modulator for modulating the single layer in-phase analog signal and the single layer quadrature analog signal to produce a single layer signal.

2. The apparatus of Claim 1, wherein the layered signal is compatible with a legacy receiver such that at least one signal layer is decodeable directly from the layered signal with the legacy receiver.

3. The apparatus of Claim 1, wherein the single layer signal from the modulator is decodeable with a legacy receiver.

4. The apparatus of Claim 1, wherein the processor comprises a logic circuit.

5. The apparatus of Claim 1, wherein decoding by the processor comprises match filtering the layered in-phase signal and the layered quadrature signal.

6. The apparatus of Claim 1, wherein the processor demodulates and decodes an upper layer signal from the layered in-phase signal and the layered quadrature signal.

7. The apparatus of Claim 6, wherein the processor produces an ideal upper layer signal including an ideal in-phase upper layer signal and an ideal quadrature upper layer signal from the decoded upper layer signal and subtracts the ideal in-phase upper layer signal and the ideal quadrature upper layer signal from the layered in-phase signal and the layered quadrature signal, respectively, to produce the single layer in-phase signal and the single layer quadrature signal.

8. The apparatus of Claim 7, wherein the layered in-phase signal and the layered quadrature signal are delayed to synchronize the subtraction.

9. The apparatus of Claim 7, wherein producing the ideal upper layer signal comprises signal processing the ideal in-phase upper layer signal and the ideal quadrature upper layer signal.

10. The apparatus of Claim 9, wherein signal processing the ideal in-phase upper layer signal and the ideal quadrature upper layer signal comprises finite impulse response matched filtering the ideal in-phase upper layer signal and the ideal quadrature upper layer signal.

11. The apparatus of Claim 9, wherein signal processing the ideal in-phase upper layer signal and the ideal quadrature upper layer signal comprises applying a signal map to the ideal in-phase upper layer signal and the ideal quadrature upper layer signal, the signal map accounting for transmission distortions of the layered signal.

12. The apparatus of Claim 9, wherein signal processing the ideal in-phase upper layer signal and the ideal quadrature upper layer signal comprises amplitude and phase matching the ideal in-phase upper layer signal and the ideal quadrature upper layer signal with the layered in-phase signal and the layered quadrature signal, respectively.

13. A digital processor for decoding a layered signal to produce a single layer signal, comprising:

a demodulator and decoder for decoding an upper layer signal from the layered signal;

an encoder for generating an ideal upper layer signal from the decoded upper layer signal;

a signal processor for modifying the ideal upper layer signal to characterize transmission and processing effects; and

a subtractor for subtracting the modified ideal upper layer signal from the layered signal to produce the single layer signal.

14. The digital processor of Claim 13, further comprising a delay function correlated to an output of the signal processor to appropriately delay the layered signal to synchronize amplitude and phase matching of the modified ideal upper layer signal and the layered signal.

15. The digital processor of Claim 13, further comprising a delay function correlated to an output of the signal processor to appropriately delay the layered signal to synchronize subtraction of the modified ideal upper layer signal and the layered signal.

16. The digital processor of Claim 13, wherein the signal processor performs finite impulse response matched filtering on the ideal upper layer signal.

17. The digital processor of Claim 13, wherein the signal processor applies a signal map to the ideal upper layer signal.

18. The digital processor of Claim 13, wherein the signal processor amplitude and phase matches the ideal upper layer signal with the layered signal.

19. A method of receiving a non-coherent layered modulation signal, comprising the steps of:

a) receiving a layered signal and producing a layered in-phase signal and a layered quadrature signal therefrom;

b) digitizing the layered in-phase signal and the layered quadrature signal;

c) decoding the layered in-phase signal and the layered quadrature signal to produce a single layer in-phase signal and a single layer quadrature signal;

d) converting the single layer in-phase signal and the single layer quadrature signal to a single layer in-phase analog signal and a single layer quadrature analog signal; and

e) modulating the single layer in-phase analog signal and the single layer quadrature analog signal to produce a single layer signal.

20. The method of Claim 19, wherein the layered signal is compatible with a legacy receiver such that at least one signal layer is decodeable directly from the layered signal with the legacy receiver.

21. The method of Claim 19, wherein the single layer signal from the modulator is decodeable with a legacy receiver.

22. The method of Claim 19, wherein the step of decoding is performed by a logic circuit.

23. The method of Claim 19, wherein the step of decoding comprises match filtering the layered in-phase signal and the layered quadrature signal.

24. The method of Claim 19, wherein the step of decoding comprises demodulating and decoding an upper layer signal from the layered in-phase signal and the layered quadrature signal.

25. The method of Claim 24, wherein the step of decoding comprises producing an ideal upper layer signal including an ideal in-phase upper layer signal and an ideal quadrature upper layer signal from the decoded upper layer signal and subtracting the ideal in-phase upper layer signal and the ideal quadrature upper layer signal from the layered in-phase signal and the layered quadrature signal, respectively, to produce the single layer in-phase signal and the single layer quadrature signal.

26. The method of Claim 25, wherein the step of decoding further comprises delaying the layered in-phase signal and the layered quadrature signal to synchronize the subtraction.

27. The method of Claim 25, wherein producing the ideal upper layer signal comprises signal processing the ideal in-phase upper layer signal and the ideal quadrature upper layer signal.

28. The method of Claim 27, wherein signal processing the ideal in-phase upper layer signal and the ideal quadrature upper layer signal comprises finite impulse response matched filtering the ideal in-phase upper layer signal and the ideal quadrature upper layer signal.

29. The method of Claim 27, wherein signal processing the ideal in-phase upper layer signal and the ideal quadrature upper layer signal comprises applying a signal map to the ideal in-phase upper layer signal and the ideal quadrature upper layer signal, the signal map accounting for transmission distortions of the layered signal.

30. The method of Claim 27, wherein signal processing the ideal in-phase upper layer signal and the ideal quadrature upper layer signal comprises amplitude and phase matching the ideal in-phase upper layer signal and the ideal quadrature upper layer signal with the layered in-phase signal and the layered quadrature signal, respectively.